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Party	Plaintiff Cardinal Health 303, Inc.
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sion rates reported as high as 43% at three months after discharge, it was the logical choice of chronic illnesses to initially study with the HHM. The UIC Home Health Telemanagement Service appears to be the only U. S. system of its kind based on and reporting clinical research outcomes data. A Phase I study, sponsored by the National Institutes of Health (NIH) was conducted for this purpose, studying 48 patients considered at high risk for readmission because of their previous CHF admission history and New York Heart Association functional classification.

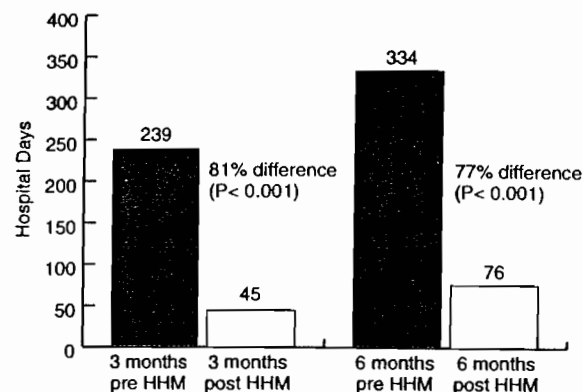
Immediately following a hospital admission for an exacerbation of CHF, patients meeting the study criteria had the HHM installed in their homes. Patient used the HHM two times daily, transmitting their data to a central monitoring station and appropriate telemanagement was implemented as described above. The outcomes of the study included CHF hospital readmission days and charges as well as health-related quality of life (QOL).

The hospital outcome data was measured as hospitalized rates, days or length of stay (LOS) and hospital charges that occurred at three and six months pre and post study enrollment. Health related QOL was measured using the Minnesota Living with Health Failure Questionnaire at study enrollment and monthly thereafter. The HHM Phase I study dramatically demonstrated clinical as well as statistical significance for all outcome variables.

Three Month Hospital Readmission Data

Data for hospital admissions at three months following study

Table 2. Hospital Days – Three and Six Months Pre and Post HHM



enrollment are compared to the pre intervention data and presented in Table 2 & 3 (see page 12). During the three months preceding study enrollment, there were 46 CHF hospital admissions among the 48 patients accounting for a total of 239 inpatient days and hospital charges of \$456,856. At three months following study enrollment, only 10 CHF hospital admissions were recorded, accounting for 45 inpatient days and totaling \$84,245 in hospital charges (P < .001).

(more on next page)

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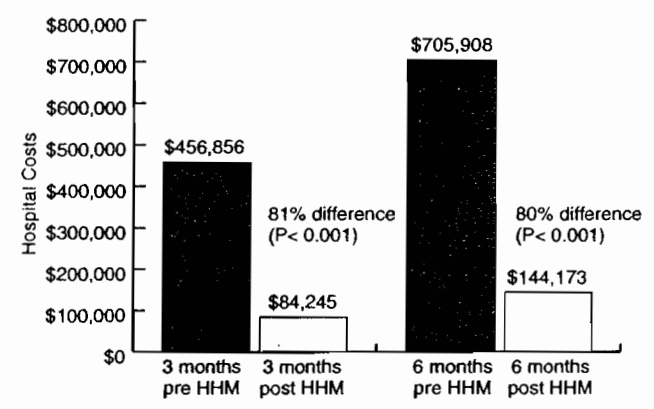
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Table 3. Hospital Costs – Three and Six Months Pre and Post HHM



CHF Re-Admission Rates

Hospital readmission rates, with reference to the most recent hospital admission prior to study enrollment are as follows:

- at 30 days post hospital discharge, 2.1% of patients were readmitted;
- at 90 days post hospital discharge, 14.6% of patients were readmitted;
- at 180 days post discharge, 29.2% of patients had been readmitted.

Local Chicago three month Medicare re-admissions rates are estimated at 17%. Current national readmission rates for CHF are reported as high as 23% at 30 days post hospital discharge and 43% at 90 days post hospital discharge.

Quality of Life

Health-related quality of life was measured using the Minnesota Living with Heart Failure Questionnaire. This tool uses 21 questions (covering physical and emotional aspects) to assess the patient perception of how having heart failure impacted their respective lives in the past month. The questionnaire was administered at study enrollment at monthly thereafter. Scores can range from 0 (best possible perceived QOL) to 21 (least desirable perceived QOL). Statistical significant ($p < 0.01$) was demonstrated at all time points during and post HHM use relative to score at time of discharge (which would reflect one month prior to discharge).

Conclusions

Throughout the study 91% of the study participants transmitted data > 1 time per day. Yet only an average of 5.1 minutes per patient/per day by the monitoring service staff interacting with and managing patients. The majority of drug-adjustment interventions (56.8%) were made in diuretic dosages in response to weight changes. Extrapolation of the system's efficacy and efficiency is obvious from the presented data. The system allows for early and aggressive interventions to prevent re-admissions. The availability of the objective data adds to the scientific value

and the ability to objectively evaluate interventions. The availability of a 24-hour central monitoring station and alarm system provided an overall safety feature.

• Considering the design limitations of this Phase I study, (non-randomized with one group serving as their own control) the implications of the results are obvious and dramatic.

• Based on the presented data, the HHM telemanagement model used at the UIC, is an efficient and effective method to reduce CHF re-admissions and therefore decrease hospital days and charges.

• Health related quality of life (QOL) for patients was significantly improved after the use of the HHM.

It is acknowledged that the best design to validate these Phase I results would be a randomized, parallel group design and the UIC has been funded by the National Institute of Health (NIH) to pursue such a study in the near future.

Implications for Telemanagement of Chronic Condition Patients In The Home

There are several major implications:

- patients recover more rapidly from post operative procedures and have an improved quality of life;
- the economics of achieving more than \$8000 in cost reductions per patient in three months for provider organizations who assume clinical and financial responsibility for chronic patient populations is excellent and more than covers the cost of technology and services;
- there is a strong potential for developing new chronic care patient management revenue opportunities for home care and other chronic care patient management organizations;
- improved chronic care treatment procedures result from continued analysis of aggregated patient data;
- new opportunities to change the behavior of patients in the management of chronic conditions that will yield better outcomes and quality of life; and,
- the use of telemanagement approaches, such as those described at UIC, can be applied, in the home, to the management of other costly patient chronic conditions.

RF

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References:

- 1 "Home Healthcare: Wired & Ready For Telemedicine", Audrey Kinsella, Information for Tomorrow, 1997. Based on sources described in that publication which includes information from the National Chronic Care Consortium and a report, "Chronic Care in America: 21st Century Challenge," Institute for Health and Aging, 1996.

technology-based home care for disease management

By: Arthur E. Schiller, Jr.

Mary Bondmass, MSN, RN, PhDc and Boaz Avitall, MD, PhD

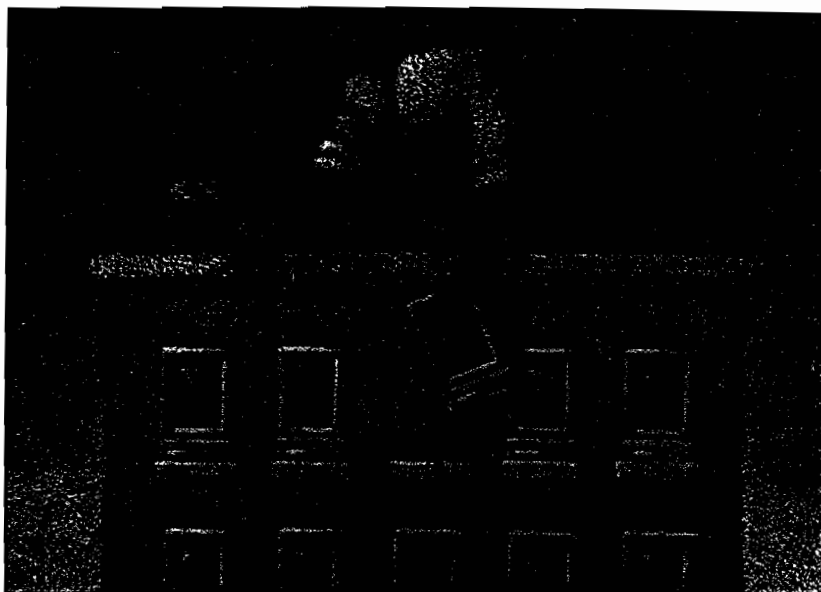
Electronic home-based patient management has long been considered a future solution for controlling costs and improving patient satisfaction. To many involved in patient care, it seems intuitive and natural. However, beyond intuition there are questions as to what diseases, clinical processes, administrative processes, and patients are best suited for technology-based home care. It is somewhat understandable that, to date, health care executives have not invested large sums solely on intuition. Reliable clinical and cost data are important to justify the investments for changing the delivery of chronic patient care.

It is assumed that disciplined research on home health patient monitoring that identifies disease specific cost reductions of approximately \$8000 per patient (three months), will contribute to the understanding of the significant value proposition for home monitoring technology, coupled with a knowledge base, for post operative and chronic care patients.

Chronic Patient Care Constitutes a Major Challenge For Cost Effective Health Care Delivery

There are a number of chronic and acute care patients in this country with different diseases. A survey made in 1994 by The National Center For Disease Statistics reported the chronic conditions per 1000 persons by sex and age in the U.S. indicates that a large portion of the U.S. population is afflicted with some chronic disease or condition.

The compressed table below simply summarizes the chronic



conditions, per 1000 people, with the greatest impact.

According to the study, a higher number of patients over 75 years of age are afflicted with chronic conditions. It is estimated that chronic illnesses and their associated complications account for an estimated 70% of annual personal health care costs.¹

The burden for payment for chronic disease management falls heavily on Medicaid and Medicare. Effective patient care management is primarily the responsibility of hospitals, physicians and home care nurses. Monitoring technology, coupled with the knowledge base, can be a major contributor to reducing the costs, improving patient satisfaction and increasing chronic patients revenues.

(more on page 10)

Table 1:

Number of Selected Reported Chronic Conditions per 1000 Persons, By Sex and Age: United States, 1994

Type of Chronic Condition	Male			Female		
	Under 45	45-64	Over 65	Under 45	45-64	Over 65
Arthritis	27.4	176.8	428.6	38.2	297.0	553.5
Heart Disease	27.0	162.0	360.5	33.1	111.0	299.4
Hypertension	31.9	220.0	319.5	32.4	224.5	395.3
Diabetes	7.3	63.3	107.3	3.9	83.0	36.9



Telemedicine

Providing Proof to Payers

A home health agency's telemedicine effort focuses on proving the effectiveness of the technology to managed care plans.

*By Bill Siwicki
Senior Editor*

For home health care agencies, 1999 may mark either their Independence Day or their Waterloo.

The Clinton administration recently issued a comprehensive set of proposals designed to curb soaring Medicare home health care costs. The measures seek to move reimbursement for home health care to a prospective payment system, similar to the way Medicare pays hospitals fixed fees set in advance for inpatient care. And until the new system would take effect in 1999, the administration has asked Congress to pass measures that would cut the growth in Medicare home health spending by about \$13 billion over the next two years.

As a result of this reimbursement squeeze, home health care providers must find a way to provide high quality home health care at lower costs or risk going out of business.

Executives at Cambrian Homecare believe they have found the way to best deliver home health care in the new era of cost-consciousness. The small, independent agency—located in the heart of managed care country, California—is banking on telemedicine as the key to securing a successful po-



PHOTO BY ERIC SANDER

From left, Cambrian's Rhiannon Acree, Joan Pimentel and Cam Johnson

sition in the home health care market of tomorrow. Cambrian, which had revenues of \$4 million last year, has invested more than \$30,000 in tele-home health care technology from American TeleCare Inc., Eden Prairie, Minn. The telemedicine equipment enables agency nurses at Cambrian's Torrance, Calif., headquarters to examine and monitor patients in their homes via standard telephone lines.

Managed care focus

"We are not a national or statewide home care provider, and for us to get a piece of the big managed care pie, we have to be able to offer the services providers and payers want. Telemedicine is the way we can serve the managed care population and prosper," says Rhiannon E. Acree, R.N., president and administrator of Cambrian. "Telemedicine is a way to deliver health care in a more cost-efficient manner while maintaining or even improving quality. And frankly, anyone not exploring such new technologies or methods today will not be here to even talk about health care tomorrow."

Cambrian's telemedicine program will be a key moneymaker for the agency, and the managed care market

will be where it all happens, Acree predicts.

"In our discussions and negotiations with managed care payers, we've found they really like telemedicine: they buy into it conceptually, they buy into the fact that telemedicine will cut costs," she says. "The HMOs and PPOs out there just need hard data that *proves* telemedicine's efficiencies. Once they're presented with that data, they'll sign on the dotted line. So it behooves us to get as much data as we can, which is what our whole telemedicine program today is all about."

The focus on collecting and analyzing telemedicine outcomes data makes Cambrian Homecare's telemedicine effort innovative and significant. Some, especially indemnity insurers, perceive telemedicine as increasing access to health care and thus increasing health care costs, and no concrete outcomes data yet exists to prove the technology improves care and lowers costs. As a result, many insurers are still reluctant to embrace telemedicine.

Many managed care payers reimburse home health care organizations with fixed lump sums per service or per patient. Consequently, many providers and payers involved with home health

in markets where managed care is dominant would embrace telemedicine if it can be proven that the technology helps provide quality care while reducing operational costs, thus increasing profit margins.

Indemnity insurers and certain other short-sighted payers haven't embraced telemedicine because they don't yet see how it can cut costs in the long run, says James Logan, M.D., secretary/treasurer of the American Telemedicine Association, Washington, and president of Logan & Associates, a Norman, Okla.-based telemedicine consulting firm.

"Cambrian Homecare is quite shrewd to specifically target managed care as a market for telemedical services. The agency can avoid the fee-for-service quagmire while positioning itself for a slice of a much larger market—managed care," Logan says. "Reimbursement barriers vaporize under managed care, assuming managed care payers are convinced telemedicine simultaneously can maintain quality and decrease costs."

Cambrian is taking the leap and doing what must be done to convince managed care payers that telemedicine is a major key to success, adds Logan, one of the judges for the Innovators Awards' telemedicine category. "The agency is gathering and analyzing operational data, and lots of it," he says. "And that strategy is essential to success."

The technology

Cambrian began using telemedicine for certain patients in February. The agency spent \$30,000 for five patient telemedicine units, which operate in a patient's home, and a base unit, which nurses run at Cambrian's main offices.

Administrative staff estimates it costs \$300 to \$400 a month for each patient receiving care via its fully operational telemedicine program. Conversely, it costs at least \$500 a month for a registered nurse to visit a home

health patient three times a week. Not only is there a clear cost differential, but the telemedicine equipment enables nurses to visit patients more than three times a week, providing a link to medical care 24 hours a day.

So far, Cambrian has treated fewer than 20 patients via telemedicine. Clinicians are focusing on using telemedicine to treat those patients who have chronic conditions, such as diabetes, that generate more comprehensive use of the system and thus generate more telling data on outcomes.

Cambrian has dubbed its tele-home health care system PATSY, for personal audio-visual telemedicine system.

The home-based component weighs 16 pounds and features a flip-up video screen and telephone handset. The unit has no telephone keypad, but instead features three large colored buttons used to initiate such things as video link-ups and blood pressure tests. The nurse's base unit component is very similar, although it features controls for clinical test operations and picture clarity.

In a typical tele-home health visit, a nurse telephones a patient. The two discuss the patient's well-being and other clinical matters. The nurse then asks the patient to press the large white button on his or her telemedicine unit to initiate a near-real-time video link-up. The nurse then can conduct a physical examination of the patient.

For example, the patient wraps a blood pressure cuff around his or her arm and presses a blue button. That causes the telemedicine unit to take blood pressure readings and digitally display the results for the patient to read back to the nurse. Also, the patient can attach a magnifying lens onto the tiny camera atop the video screen. This enables the patient, for example, to set an insulin syringe on the lens

so the nurse can ensure proper medication dosages.

A tele-stethoscope connected to the patient's telemedicine unit enables nurses to listen to patients' heart, lung and bowel sounds. During an examination, a nurse instructs a patient via video about where on the chest or back to place the device. The stethoscope requires its own telephone line to transmit the sounds from

inside the patient. If the patient does not have a second phone line available, a piece of technological innovation is used to transmit the audio feed. A cellular component built directly into the stethoscope can dial the Cambrian

base unit and transmit the patient's heart, lung and bowel sounds via a cellular phone-type connection.

This fall, American TeleCare will add electrocardiogram capabilities to its telemedicine system. Cambrian nursing staff are anxious to add this clinical test to their telemedical repertoire to better monitor patients and glean enhanced outcomes data, Acree says.

Patient empowerment

Because patients are so involved in administering these clinical tests, the patients feel more empowered and more a part of the medical process, says Joan Pimentel, R.N., Cambrian's telemedicine coordinator and clinical education and training coordinator.

"Patients like the additional control they suddenly have through telemedicine," Pimentel says. "And it serves to better educate them on all kinds of health care matters, such as what exactly blood pressure is and why it's crucial to manage medications precisely and consistently."

Cambrian's nurses already are seeing some trends in their early clinical outcomes data. One such example is

"They're shrewd to specifically target managed care as a market for telemedical services."

decreased emergency situations that force patients to visit a hospital emergency department. The baseline data that staff members are collecting includes patient name, patient clinical problems, visit times and lengths, and when and how home care staff have prevented physician and/or emergency department visit costs.

Cambrian expected to sign a contract by July 1 with a California-based HMO for home health care services that include telemedicine and reimbursement for telemedical services. Cambrian is in discussions or negotiations with other managed

care organizations. The home care provider sees the accumulation of more data making such negotiations a much easier task.

"In our negotiations today, for example, we have one organization looking to reimburse our telemedicine services at a per-visit rate and another organization looking to reimburse us through a capitated monthly rate," Acree says. "Paying a monthly rate for telemedicine is very intriguing to us because it enables us to accept the risk in a managed care scenario. Ideally, though, I would like to have both such styles of reimbursement so we

can gather hard data on which may or may not work better for providers."

Cambrian plans to have formal data by the end of the year that substantiates reduced emergency department visits, costs payers have saved, patient satisfaction levels with telemedical care, and information on what would have happened in patient cases if telemedicine were not in place.

"Today, we're in serious discussions or negotiations with 10 different providers and payers concerning telemedicine," Acree says. "If we don't get this data fast, nobody will be talking with us." ■



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tele-home care in a managed care setting

"A Case Study of a Provider Using Tele-Home Care (Telemedicine)"

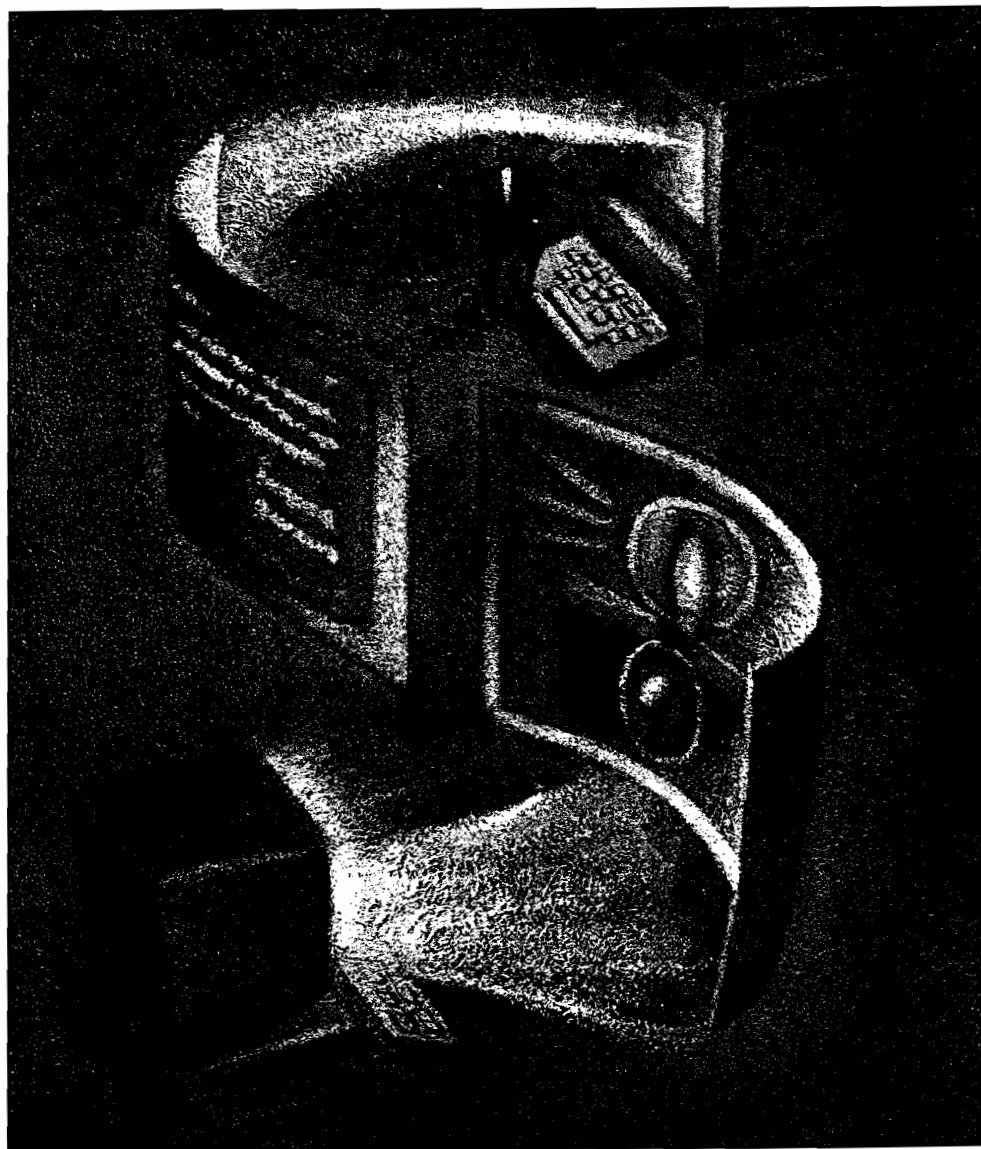
By: Barry K. Baines, MD

As the growth in home health care continues, new challenges will appear that will create opportunities for those organizations whose clinical, operational and financial "worlds" are in alignment. This alignment will allow for innovation in the delivery of home health care services to patients. One such innovation is the use of "tele-home care" technology. For the purposes of this article, tele-home care is defined as providing an interactive video telephone home care visit by a home health nurse.

This article will describe the application of this technology by a home health care agency in a managed care setting. Equipment set-up, patient selection, and outcomes of the project will be described.

BACKGROUND

The home care agency is part of an integrated health care delivery system. It operates as a "cost-center" rather than a "profit center." In addition, most of the over-65 population are enrolled in a Medicare risk contract. This situ-



.....there was a 30% reduction in overall per member/per month medical costs. Half of these savings were the result of a decrease in inpatient costs. The remainder of the savings were distributed among Emergency Room, Durable Medical Equipment, Home Care, and Outpatient clinic costs.

ation empowers the home care agency to pursue care delivery options that focus on improving care for the entire system. Whether a service is reimbursable or not, is not an issue. The added value of the service to the system is critical. This is important in the case of tele-home care services, which currently aren't reimbursed by Medicare.

EQUIPMENT SET-UP FOR PATIENTS

Ten portable telemedicine units were purchased. These units utilize regular telephone lines for their operation. They are simple to use, requiring the push of one button to activate. The units allow for direct viewing of the patient; measurement of blood pressure, and a telephonic stethoscope that enables the nurse to listen to heart and lung sounds.

Once a patient was referred for tele-home care services, and patient consent was obtained, an additional telephone line was installed in the patient's home at the expense of the healthplan. The tele-home care nurse would install the unit in the patient's home and educate the patient on how to operate the unit. Tele-home care visits were set-up on a scheduled basis. While the patient was receiving tele-home care services, the healthplan also paid for the monthly telephone service.

FOR THE NURSE

A central telemedicine unit was purchased and installed in the office of the home health agency. The central unit allowed for two-way viewing (nurse-patient and patient-nurse). One nurse conducted almost all of the video visits on a scheduled basis.

PATIENT SELECTION

Criteria were developed for appropriate patient selection. These criteria were categorized by their clinical, operational or utilization indications. Patients usually met at least one indicator in each of the following categories:

CLINICAL INDICATIONS

Chronic disease in a state of decline:

- Congestive Heart Failure
- Chronic Lung Disease
- Diabetes
- Dementia
- Cancer

OPERATIONAL INDICATIONS

- Patients requiring two or more home care nursing visits per week.
- Patients that do not require "hands on" care with each visit.
- Patients with an unreliable caregiver situation.
- Patients with poor compliance to instructions or medication use.

UTILIZATION INDICATIONS

- Patients requiring frequent clinic visits (they are usually anxious).
- Patients seen in the emergency room within the past two months.
- Patients hospitalized within the past 6 months.

OUTCOMES FOR TELE-HOME CARE SERVICES

There were 14 patients for whom outcome measurements were initially obtained. These outcomes were measured in the areas of care utilization, medical costs, patient satisfaction, and provider satisfaction.

CARE UTILIZATION

Patients received tele-home care service an average of three months. The average number of tele-home care visits for each patient was 5.3 per month. After tele-home care services were started, patient-provider contacts increased almost 30%. However, in spite of these increased contacts, there was a 30% reduction in overall per member/per month medical costs. Half of these savings were the result of a decrease in inpatient costs. The remainder of the savings were distributed among Emergency Room, Durable Medical Equipment, Home care, and Outpatient clinic costs.

PATIENT SATISFACTION

The results of patient satisfaction survey indicated that the majority of patients receiving tele-home care services were highly satisfied with the services. Patients found the system easy to use. They especially appreciated the security and convenience of having personal and professional attention without requiring travel. Patients and their families found the use of this system reassuring because of the perceived increased accessibility to care providers.

PROVIDER SATISFACTION

The home health nursing staff believed that the tele-home care visits resulted in more efficient use of professional nursing time. There were several times that early detection of deteriorating status resulted in a timely intervention that avoided an inpatient admission.

The primary physicians generally had a minimal awareness as to whether or not patients were receiving tele-home care services. When apprised of this program, several did acknowledge a reduction in physician visits and/or phone calls.

CONCLUSIONS

Upon reviewing all of the information collected on tele-home care patients, the following conclusions were reached: 1) Quality of care was either improved or maintained by tele-home care visits, 2) Operational implementation of tele-home care was not difficult, 3) Tele-home care was readily accepted by patients, their families, and health care providers, and 4) Tele-home care was associated with reduced health-care costs.

Although the use of tele-home care is still in its infancy, these early results support the continued experimentation with this technology. Many questions remain to be answered

such as:

- Which patients receive the most benefit from tele-home care?
- Is there an optimal length of time to provide these services?
- In what other care venues will this technology add value?

To thrive and succeed, it is imperative that home health care position itself as a discipline committed to innovation in the application of technology to improve the care of patients and their communities. It is important that we are not diverted by technology for technology's sake, but rather to use technology as a tool to improve the quality of life of the patients we serve.



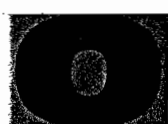
Barry K. Baines, MD is Associate Medical Director for Centralized Patient Care Services for HealthPartners, Minneapolis, MN



American TeleCare

Tele-home healthcare

Introduction

 Our last close look at tele-home health was in September 1995 (Vol. 3, No. 3). At the time we knew only of two, maybe three, tele-home nursing projects in the U.S. Our 4th Annual Survey shows at least 10 programs active in 1997. These are all small, the largest following about 300 patients in a year's time. It appears that the numbers are going to start increasing very rapidly, for two reasons. First, the technology has evolved so that effective interactive nurse-patient interactions can be done over regular phone lines, using equipment that costs less than a personal computer – sometimes far less. Second, the economics of tele-home health care are extraordinarily compelling.

A recent study, in which I participated, underscores this dramatically. In that study, over 900 nursing charts from home health agencies in Massachusetts, Chicago, and Kansas City were reviewed to assess the activities undertaken by visiting nurses during the home health visit. Our preliminary analysis, to be updated this fall, found that over half of all nursing activities were such that they could be done remotely, using telecommunications technologies. Moreover, the consistent evidence from current tele-home health projects is that the total cost of providing service electronically is less than half the cost of an on-site nursing visit, with no decrement in quality of care or participant satisfaction. Why? Because on-site home nursing is highly inefficient. On average a visiting nurse can see only 5.2 patients/day, because much of the day is spent driving. A tele-home nurse can care for 15-25 patients a day. This doesn't mean simply that more individual patients can be seen. It also means that the same patient can be seen 2 or even 3 times daily. This is good for patient care, and economically could never be done with an on-site visiting nurse.

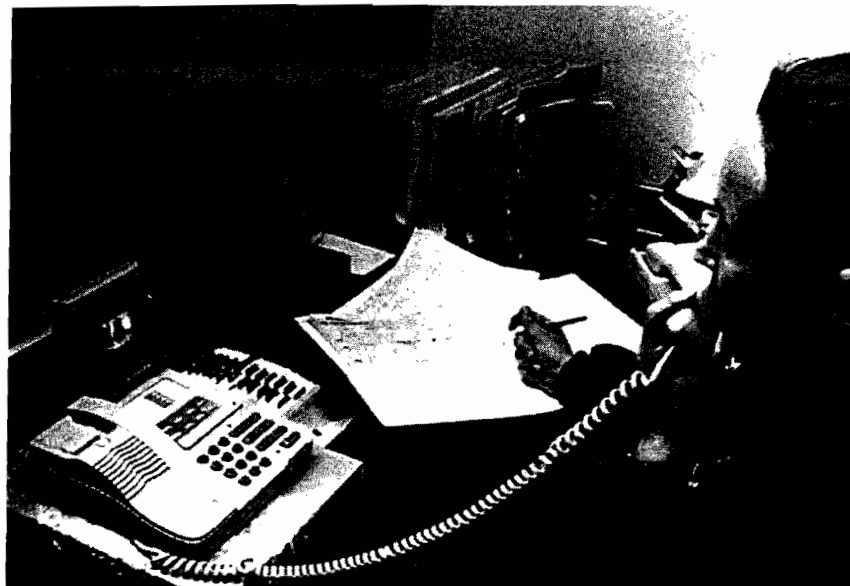
We'll follow up in our December issue with Tele-Home Health Care Part 2. Look for an update on Dr. Keiko Nakumura's ISDN-mediated tele-home health project in Tokyo, as well as developments in Italy, Israel, Canada, and the U.S.

*Designated TeleHealth Nurse
monitors her patient*

Barbara Johnston, RN, MSN
Hospice Program and Marketing and
Research Manager

Linda Wheeler, RN, MSN Home
Health Agency and Site Manager

Jill Deuser, RN, MBA Senior Project
Manager, Interactive Technologies Initiative



Kaiser Permanente Medical Center's Pilot Tele-Home Health Project

**From the Home Health Dep't, Tele-Home Health Project,
Kaiser Permanente Medical Center, Sacramento, CA**

The study was supported by the Interactive Technologies Initiative, Kaiser Permanente Medical Care Program, Oakland, CA.
Ann Richards, BSN, was the telehealth nurse for the project.

Mandate for change

The Tele-Home Health project is occurring during a time of great change in health care. Society is mandating that health care costs be controlled while maintaining quality and access to care. The highest utilizers of home health services are the elderly—also the most rapidly growing segment of our population. Kaiser Sacramento's Home Health Department alone has seen its new referrals increase from an average of 360/month in the first quarter of 1996 to 520/month in the first quarter of 1997. We felt that remote consultation technology should be explored because it might allow us to maintain and even improve patient contact while reducing travel costs.

Over the past several years hospital days have dramatically decreased and more patients have been receiving care in the home setting. The Tele-Home Health project was a natural link between the medical center and patients' homes. Although people generally prefer to receive services in their homes, this shift away from the hospital and clinic setting may jeopardize the patient/provider relationship. Remote

consultation technology, if implemented successfully, could help to bridge that gap and ensure that quality health care will not be sacrificed to cost savings.

Concept to implementation

The proposal to introduce Tele-Home Health was brought to Kaiser's Interactive Technologies Initiative (ITI) for consideration. ITI began operating in late 1995 to identify, develop and evaluate new models of health care delivery using interactive technologies. Telemedicine/Telehealth technologies are key areas of interest, and have been deployed in several projects. These utilize different equipment and network solutions depending on the medical specialty being addressed, but share the goal of improving member access and satisfaction while maintaining or improving quality of care.

The home health project was undertaken in a research setting because there was insufficient peer-reviewed literature regarding quality outcomes and cost-benefits provided by tele-home health care. There were simply not enough findings available to make a business

decision in support of widespread implementation of telemedicine. With this in mind, Tele-Home Health was designed to include a rigorous evaluation methodology that would measure changes to access, service, quality of care, and cost-benefit.

Research design

This pilot project uses a randomized design with one hundred patients in the treatment (intervention) group and one hundred in the control group. Control group patients receive their home health care in the usual manner: most visits are in-person by a visiting nurse, with some visits conducted via telephone. A telephone visit is commonly used to follow up on patients who are reporting their health status or any response to medication changes. The treatment group receives some in-person visits and some visits using a remote consultation, home-based video system. The system selected for this research study was developed by American Telecare, Inc. (Eden Prairie, MN. telecare@mn.uswest.net). It operates over ordinary telephone lines, takes very little time to install, and even frail and elderly patients find it simple to use (*Photo opposite page*). Each unit

This is an interim report of a Kaiser Home Health Department study of the use of telemedicine technology in the home care setting. We present our study design and some early findings from the first six months of the project. Preliminary findings indicate the technology is dependable, and that average telehealth video visits are cost-effective and are about 60% shorter (18 minutes vs. 45 minutes) than on-site visits, with no decrease in patient satisfaction. The study will be completed in September of 1997.

This study was initiated in 1996 to explore improving access to health services while maintaining quality of care, and to demonstrate the cost effectiveness of remote consultation technology in the home health setting. The study, which began in May 1996, employs a randomized design approved by the Institutional Review Board and will be completed in approximately one year.

This project was titled Tele-Home Health to acknowledge that a multidisciplinary health care team would be caring for patients in their homes through the use of a telecommunications tool. Our multi-disciplinary team would be composed mainly of nurse case managers, but would also include physical therapists, speech therapists, occupational therapists, home health aides, licensed vocational nurses and physicians.



Home health patient and his wife talk to nurse during a tele-home health visit.

has an electronic stethoscope (American Telecare) which also operates over an ordinary phone line. Because the video and electronic stethoscope cannot operate over the same phone line, participating patients had a separate phone line installed at their home. Twenty units were deployed for this study, rotated among the 100 patients as needed.

Inclusion in the study was limited to patients with specific diagnostic and utilization criteria. Participants had to have been diagnosed with COPD (chronic obstructive pulmonary disease), cardiac disease, CVA (cerebral vascular accident), wound care, and/or anxiety. Furthermore, they needed to have two or more visits per week for some period over the course of the project.

Patients were encouraged to complete satisfaction surveys. To determine cost effective-

ness, the study compares: a) cost per visit and cost per case; b) numbers of outside referrals; c) staff productivity; d) reduction in unnecessary visits to urgent care, emergency department or hospital days.

Barriers

Realizing that some of our home health staff would regard Tele-Home Health with skepticism, plans were made from the onset to educate staff and take their concerns into account. We were aware that the intro-

duction of this new technology in the Sacramento home health department would be particularly stressful in light of Kaiser Permanente's broader organizational redesign, which is ongoing. To ease the transition, we phased in use of the home health video system rather than introducing it all at once. In Phase One all the video visits were done by a designated TeleHealth Nurse (*Photo opposite*). In Phase Two other staff were trained to do these visits, and were expected to use the system as

part of their regular patient care practice.

Initially there was significant staff resistance to using the home video system. The major concern was that the home video system would replace nurses, resulting in lost jobs. Also, the nursing staff felt they were being asked to accept a change that might threaten their professional relationship with patients. One strategy that helped to lower staff resis-

To ease the transition, we phased in use of the home health video system rather than introducing it all at once.

tance was a communication plan that apprised people of project developments and nipped in the bud misperceptions surrounding its

implementation.

Staff acceptance developed as providers saw how much their patients liked using the system. Also, providers found that telehealth allows for more flexibility in their daily schedules. For instance, if a nurse has two patients requesting a home visit from 10-11 A.M., only one can be accommodated. The home video system allows a nurse to visit a patient and within 15-20 minutes be with another. The staff has found the system easy to *continued page 19*

Table 1

In-person vs. telenursing visits

Feature	Type of Visit	
	In-person	Video
MAXIMUM DAILY CASELOAD	5.2 patients	15-20 patients
VISIT LENGTH	45 minutes	18 minutes
TRAVEL TIME REQUIRED	Yes	None
MILEAGE COSTS	Yes	None
RESPONSE TIME	Triaged over phone by RN; then, as appropriate, an in-person visit within 24 - 48 hours	Triaged over phone by RN; then, as appropriate, an immediate televideo visit

use, but the biggest selling point has been in seeing how reassured patients are to know that they have instant home access to their health care providers.

Tele-Home Health does not replace all in-person visits. The home video system is an additional service. Some visits require hands-on care and these continue to be done in-person. In some cases, however, patients have even asked their nurses to use the remote system instead of visiting in person because it is very convenient.

Preliminary Findings

Patient satisfaction surveys, with over a 70% survey return rate, indicate patients like using the home video system, find it simple to use, and feel it is very reassuring. Staff satisfaction using the system is also very high. Preliminary findings indicate this technology is cost effective when integrated properly in the home care setting, with savings of about 33%-50% compared to on-site visits.

Typical comments from patients include: "The system was very basic and easy to use" and "Consoling to know you had help that close and I knew if I needed help I didn't have to wait".

The current organizational pressure to increase productivity has affected the degree to which home health staff was willing to participate in Tele-Home Health. Until the value of using the technology is personal and experienced by the individual nurse, buy-in will likely be limited. Adding telehealth visits to an already hectic day and not counting telehealth into productivity will decrease staff participation. Our organization is developing guidelines for telephonic and video visits, including how to integrate these methods appropriately into a patient care plan.

The profession of nursing is for the first time being confronted with job uncertainty. Remington (see references) addressed this fear by stating that telehealth will only put nurses out of the job of driving a car to see a patient. Nurses will continue to provide patient care, but in a more efficient manner. The major goal of home health care has always been to move patients toward self care. A patient commented on their survey, "When I needed them they were there." Telehealth encourages patients to become active partners in their own health care management. We will learn during this study how to use telenursing to supplement their home care and to improve access to services.

EQUIPMENT USED :

**Personal Telemedicine Module
(incl. CareTone electronic
stethoscope and BP cuff),
American TeleCare, Eden Prairie, MN.
Price for single home unit: \$3,900.
612-897-0000;
www.telemed-care.com.**

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"Home is where the Heart is" - est. 1947

Home Health

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- ♥ Our Care Team
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HOME HEALTH CARE What We Offer

Livingston Memorial Visiting Nurse Association offers a variety of home health services ranging from rehabilitation to infusion therapy to palliative care to hospice care. We offer services to the community including support groups and education classes. LMVNA staff includes nurses with experience in areas such as, geriatrics, orthopedics, wound care, and infusion therapy. Our therapy component is extensive and includes physical, speech, and occupational therapists. We employ licensed medical social workers to serve the extensive psychosocial needs of patients and their families. Licensed dietitians provide nutrition counseling. This level of service is unique in Ventura County but, in our opinion, necessary to properly serve our high volume of active patients.

Services Offered:

- Skilled monitoring of medical/surgical conditions
- Telehealth services
- Intravenous (IV) therapy
- Catheter care and management
- Diabetic instruction
- Ostomy and wound care
- Home safety evaluation and functional assessment
- Rehabilitative services: physical therapy, speech therapy and occupational therapy
- Medical social work
- Palliative care
- Nutrition counseling
- ET (Enterostomal Therapy) nursing

Infusion Therapy

Advances in health care technology make it possible for many IV patients to receive treatment safely and conveniently at home. Livingston Memorial Visiting Nurse Association's home infusion therapy program combines high-tech nursing skills with patient and family education to provide the most comprehensive, quality care available. Livingston Memorial Visiting Nurse Association's IV-competent registered nurses work in conjunction with each patient's personal physician.

- PICC line maintenance
- Total parenteral nutrition
- Antibiotic/anti-infective therapy
- Hydration
- Care of all central venous access devices and peripheral lines
- Pain management: subcutaneous, parenteral and portable PCA pumps
- Drug information services
- Coordination of IV supplies and pumps
- Medication administration instruction
- Durable medical equipment coordination

EXHIBIT

B